II.   CLAIM AMENDMENTS

1. (Currently Amended)   A method for determining a physical property as a function of a n-dimensional domain, with n being a natural number, whereby values of said physical property correspond to vertices of a n-dimensional first grid representing the domain, said method comprising the steps of:

>   determining, for a set of cells of said first grid, at least one inner point per cell, whereby said inner points, together with the vertices of the first grid, form a respective second grid;

>   determining, for each of said inner points, a corresponding value of the physical property at said inner point, ~~whereby~~ wherein in case a predefined criterion is <u>fulfilled, said value at the inner point is obtained by interpolation, and wherein in case the predefined criterion is</u> not fulfilled, said value at the inner point is obtained by performing a measurement.

2. (Original)   The method of claim 1, wherein in case said criterion is fulfilled, said value at the inner point is not obtained by performing a measurement.

3. (Cancelled)

4. (Original)   The method according to claim 1, wherein, in case said value at the inner point is obtained by interpolation, said interpolation is performed with respect to the values of the physical property at the vertices of the cell corresponding to said at least one inner point.

5. (Original)   The method according to claim 1, wherein the corners of said cells coincide with vertices of said first grid.

6. (Original)   The method according to claim 1, wherein said cells are elementary cells of said first grid.

7. (Original)   The method according to claim 1, wherein said inner points are the

2

central points of said cells.

8. (Original)   The method according to claim 1, wherein said criterion is fulfilled if the variation of the values of the physical property at the vertices of the corresponding cell does not exceed a predefined limit.

9. (Original)   The method according to claim 1, wherein said criterion is fulfilled if the values of the physical property at the vertices of the corresponding cell are substantially equal to each other.

10. (Original)   The method according to claim 9, wherein, in case the values at the vertices of the corresponding cell are substantially equal to each other, said value is assigned to the at least one inner point of said cell.

11. (Original)   The method according to claim 1, comprising a step of determining, for each one of the values at the vertices of the corresponding cell, whether said value is a minimum value, an intermediate value or a maximum value of the range of possible values of said physical property.

12. (Original)   The method according to claim 11, wherein said criterion is fulfilled

if all the values of the physical property at the vertices of the corresponding cell are minimum values, or

if all the values of the physical property at the vertices of the corresponding cell are intermediate values, or

if all the values of the physical property at the vertices of the corresponding cell are maximum values.

13. (Original)   The method according to claim 1, wherein the range of possible values of the physical property is partitioned into a set of m sub-intervals, with $m \geq 2$ being a natural number.

14. (Original)   The method according to claim 13, wherein said criterion is fulfilled if all

3

the values of the physical property at the vertices of the corresponding cell lie within the same sub-interval.

15. (Original)   The method according to claim 11, wherein, in case said criterion is fulfilled, a mean value of the values at the vertices of the corresponding cell is assigned to the at least one inner point of said cell.

16. (Original)   The method according to claim 1, wherein for each vertex, a flag is maintained that indicates if the value corresponding to said vertex has been obtained by interpolation or by measurement.

17. (Original)   The method according to claim 1, wherein a mode of operation can be selected in which, for one or more of the inner points, and irrespective of said criterion, a measurement is performed.

18. (Original)   The method according to claim 1, wherein said step of determining at least one inner point per cell is carried out at least once in order to refine said first grid.

19. (Original)   The method according to claim 18, wherein the step of refining the grid is iteratively repeated for a number of times until a predefined resolution is reached.

20. (Original)   The method according to claim 1, wherein said method is applied for at least one of a group comprising: testing of a device under test – DUT - , chip testing, determining bit error rates.

21. (Original)   The method according to claim 1, wherein said method is applied for determining an eye diagram, whereby said physical property is the number of fails.

22. (Original)   The method according to claim 21, wherein said number of fails is determined as a function of a two-dimensional grid, said grid comprising a first coordinate indicating the timing of the measurement pulses, and a second coordinate indicating the threshold voltage used for digitizing received bit streams.

23. (Cancelled)

24. (Currently Amended) An apparatus for determining a physical property as a function of a n-dimensional domain, with n being a natural number, whereby values of said physical property correspond to vertices of a n-dimensional first grid representing the domain, said apparatus comprising

a grid refinement unit adapted for determining, for a set of cells of said first grid, at least one inner point per cell, whereby said inner points, together with the vertices of the first grid, form a respective second grid;

an interpolation unit adapted for determining, for each of said inner points, a corresponding value of the physical property at said inner point, wherein in case a predefined criterion is fulfilled, said value at the inner point is obtained by interpolation, and ~~whereby~~wherein in case a predefined criterion is not fulfilled, said value at the inner point is obtained by performing a measurement.

25. (Original) The apparatus of claim 24, said apparatus being adapted for at least one of a group comprising: testing a device under test – DUT -, testing of chips, determining bit error rates.

26. (Cancelled)